



Ashesi University

**Assessing the Effect of Inequality on Sectoral Economic Growth in Sub-Saharan
Africa**

Undergraduate dissertation submitted to the Department of Business Administration, Ashesi
University. Submitted in partial fulfilment of the requirements for the award of Bachelor of
Science Degree in Business Administration

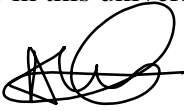
B.Sc. Business Administration

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April 2022

DECLARATION PAGE


I hereby declare that this dissertation is my original study and that none of its parts have been presented for another degree in this university or elsewhere.

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Date: 25th April 2022

I hereby declare that the submitted dissertation and presentation of it were supervised in accordance with the guidelines on supervision of thesis laid down by Ashesi University.

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ABSTRACT

Inequality has received much attention over the recent years due to its numerous effects on growth in an economy. Existing studies on the effects on inequality have been widely documented especially on economic growth. However, most of these studies have focused on inequality and economic growth at the aggregate level, while little consideration is given to sectoral growth. Therefore, this paper examines the relationship between inequality and growth in the agriculture, manufacturing, and service sectors for the sub-Saharan Africa region. The study employed the Ordinary Least Squares regression model on pooled cross-sectional data from 30 SSA countries with their most recent available data. The results revealed that a significant negative relationship exists between inequality and growth in the manufacturing sector. On the other hand, a negative non-significant relationship was found between inequality and agricultural growth and a positive insignificant relationship for the service sector. Ultimately, the significant negative relationship found implies that in the presence of high inequality, growth in the manufacturing sector is reduced. Hence, in the fight against inequality, policy makers and government bodies must gear their redistributive and welfare efforts more towards the manufacturing sector.

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LIST OF ACRONYMS

Acronym	Meaning
ASEAN	Association of Southeast Asian Nations
GDP	Gross Domestic Product
IMF	International Monetary Fund
LDC	Less Developed Countries
OLS	Ordinary Least Squares
UNDP	United Nations Development Programme
WDI	World Development Indicators

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CHAPTER ONE: INTRODUCTION

Background

Inequality has existed for as long as humanity has existed. No matter how hard they have tried, no human society has been successful at completely eradicating inequality. In other words, no nation or named human group can boast of a state of perfect equality. Inequality simply explained as a state of not being equal or “the phenomenon of unequal and/or unjust distribution of resources and opportunities among the members of a given society” (Koh, 2020), is one of the most widely spread and globally recognized social evils. It has been the focal point of several economic and social policy debates across the globe, as many try to achieve the state of “fair and equitable distribution of income” as proposed by Rousseau (2004).

Although most people automatically think of income inequality when we speak of inequality, inequality exists in different forms. It may either be expressed in outcome or in opportunity (Lefrance, Pistoiesi & Trannoy, 2008). Inequality of outcome, the concept of inequality, which is more common with the general populace, refers to inequality which results from the economic, geographic, and social process of generating a livelihood. On the other hand, inequality of opportunity considers the disparity that stems from factors beyond the scope of human responsibility, which make individuals suffer the effects of factors they cannot be held responsible for (Lefrance, Pistoiesi & Trannoy, 2008). Breaking down these forms of inequality, we arrive at more commonly expressed forms of inequality which include income and wealth inequality, political inequality, gender inequality and

less familiar ones such as inequality of membership and inequality of treatment and responsibility.

At least one form of inequality exists within every human society, and the effects thereof are numerous and multifaceted. Every society endures the consequences of this phenomenon, but certainly not in the same measure. This points to the fact that inequality is not specific to any group. However, the difference in the intensity of inequality across continents, countries, and cities cannot be disputed.

Global Inequality (“Between – Country” Inequality)

Defined as the concentration of resources in particular countries, which affects the opportunities available to individuals in less powerful countries, global inequality has seen a decline since the 1990s (IMF, 2021). During the middle twentieth century, there was a rise in global economic cooperation. This led to a surge in economic growth and development. The GDP per capita growth rates of less developed countries (Asia in particular) shot up significantly which sped up the convergence of income levels across nations. The LDCs started to catch up with the advanced countries enabling thousands and thousands of households to escape poverty (Bourguignon, 2015). This first translated into a stabilization of global income inequality levels and then a subsequent rapid decline in the last three decades.

However, this has not always been the case. In the nineteenth century and for the most part of the twentieth century, global inequality experienced a meteoric rise which was evident in the increasing disparities between countries as measured by their per capita income. The developed nations, mainly in Europe and North America, took off speedily

and with great momentum. With the advent of industrialization and the discovery of modernised practices, these countries broke out into an accelerated trajectory of visible economic growth and development leaving the rest of the world trailing behind. This resulted in striking differences in income levels and standards of living across nations, thereby causing a steady increase in global inequality levels for that period. The decline in global inequality levels only set in at the end of the twentieth century when global economic cooperation became a common phenomenon. The trend in global inequality is displayed in the graph below.

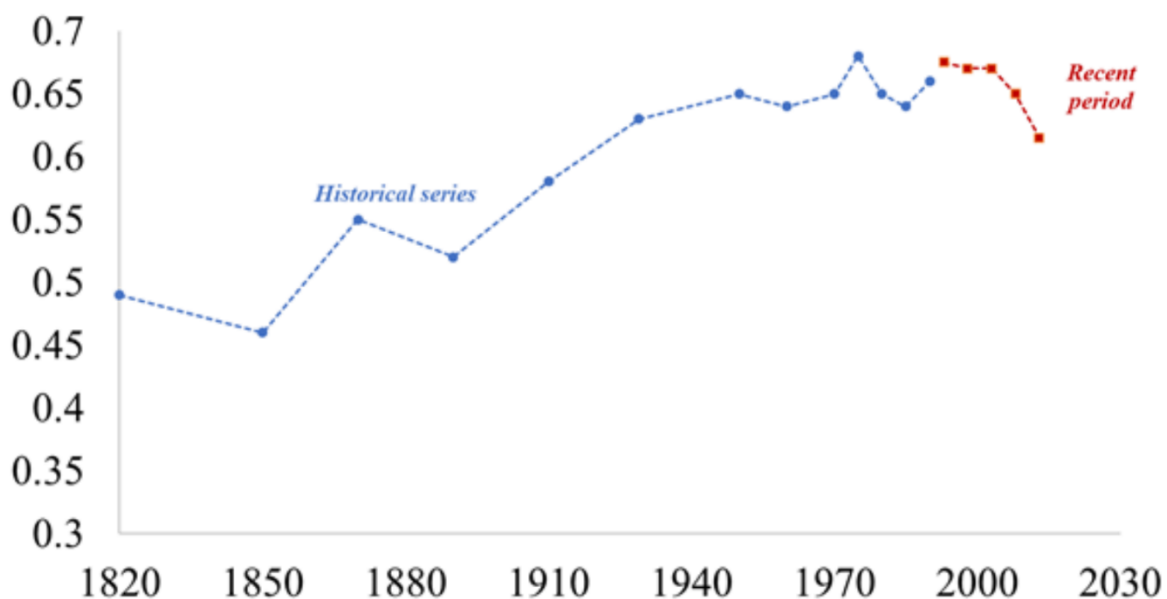


Figure 1: A Series of Global Income Inequality from the 18th Century to the 21st Century

Source: IMF Introduction to Inequality (2021)

Unmistakably though, the income convergence experienced in the last few decades cannot be generalized for all less-developed regions. While some regions noticeably experienced and benefitted from the convergence, others merely had a foretaste of it. For instance, the average income growth recorded for sub-Saharan Africa was less intensive

than that of Asia's (IMF, 2021). Currently, Latin America and the Middle East are rated as the world's most unequal regions as the top 10% wealthy citizens control 54% and 56% of their average national income. The Gulf countries in the Middle East have reported extreme inequality levels with little to no variation since the 1990s (World Inequality Database, 2021).

Interest in global inequality continues to spike as the world becomes increasingly interconnected. This heightened interest is further strengthened by the threats of a possible reversal of the achievements made in reducing global inequality so far due to the Coronavirus pandemic. Fears stem from the fact that the less-developed economies might not have the resources and capacity to withstand the shock from the COVID-19 crisis as compared to their advanced counterparts. This might mean that recovery efforts may be more impactful in developed countries than less developed ones, reintroducing disparity levels that may have been eliminated.

Domestic Inequality (Inequality Within Countries)

While global inequality has experienced a decline in recent years, the same cannot be said for within-country inequalities. Unlike global inequality, which has experienced a remarkable reduction over the last few decades, domestic inequality has been on the rise, especially for developed countries. An analysis performed by the IMF (2021) revealed that close to 90% of advanced economies have experienced an increase in income inequality with 70% seeing an increase greater than two percentage points in their Gini coefficients. The rise in domestic income inequality from a sample of six countries (one from each

continent) is illustrated in Figure 2 below. It is observed that, except for Brazil, all other countries had a Gini coefficient higher than that of the earliest year by the end of 2014.

Inequality of incomes, 1970 to 2014

This chart presents time-series which are consistent over time for each country. Before making cross-country comparisons please check the definitions on the 'Sources' tab.

Our World
in Data

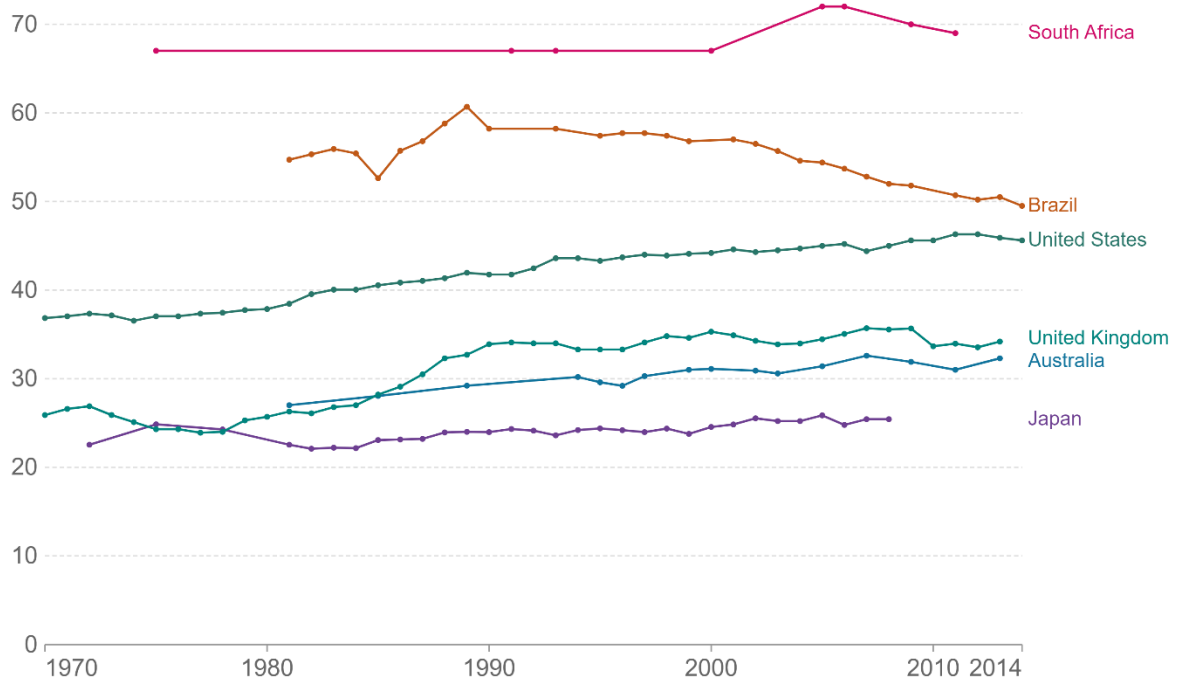


Figure 2: Inequality in Incomes from 1970 to 2014

Source: Chartbook of Economic Inequality (2016)

The steadily increasing trend in domestic inequality is often attributed to certain key factors, which include technological progress, commodity price cycles, globalization, and domestic economic policies such as redistributive fiscal policies (International Monetary Fund, 2021).

Economic Growth and Inequality in Sub-Saharan Africa

Although Africa has recorded commendable economic progress over the last two to three decades, unequal income and wealth distribution remains a festering issue. Labelled by the World Bank as the second most unequal continent in the world in 2009, Africa has the highest gap between the incomes of the top 10% and the bottom 50%, with the income of the top 10% being 30 times higher than the bottom 50% (African Development Bank, 2014). The gap between the elites and those at the end of the social ladder in most African countries is everything but inconspicuous. It is not uncommon to sight chronic poverty coexisting with unmistakable signs of affluence and wealth.

Zoning in on Sub-Saharan Africa, Ghura and HadjiMichael (1996) described the region's aggregate economic performance as unsatisfactory over the past decade (from 1980 to 1990). They, however, go on to acknowledge that a few countries have individually recorded significant growth which cannot be overlooked. This paper attributes the appalling aggregate performance to population growth, unfavourable weather, and inappropriate macroeconomic policies. This economic trend seems to have changed in later years as an IMF economic issue by Basu, Calamitsis and Ghura (2000) expressed that a growing number of SSA nations were giving off signs of economic progress following the implementation of some structural reforms. Data from the World Bank corroborates these findings. It is seen that, between 1981 and 1985, GDP fell from \$371 billion to \$247 billion. After 1986, however, it started increasing steadily, and by the end of 2014, GDP had shot up to \$1.85 trillion. Despite the notable economic progress made, poverty is still prevalent and severe in certain parts of the region. This goes to say that the benefits from the region's economic growth have not been far-reaching but have accrued only to a fortunate few.

A closer look at inequality within the region reveals that rising levels of income inequality have been the norm over the past two decades (Gimba, Seraj & Ozdeser, 2021). After Latin America, sub-Saharan Africa has been declared to have the highest average economic inequality in the world, and out of the nineteen most unequal countries in the world, ten are found in sub-Saharan Africa. The alarming level of inequality within the SSA region is attributed to factors which drive income disparities such as the unequal distribution socioeconomic amenities and facilities, suboptimal transitions from low-inequality sectors to high-inequality sectors, and an increase in the terms of trade in resource-abundant countries (Oduola et al. 2017). This glaring existence of inequality in the face of significant economic growth gives rise to the need to examine how the two variables are related.

Problem Statement

A breakdown of inequality data for sub-Saharan Africa reveals that the region is considered the second most unequal region globally. As a matter of fact, ten out of the nineteen most unequal countries are found in sub-Saharan Africa (Oduola, Cornia, Borat & Conceicao, 2017). However, changes in inequality across the region are largely heterogenous. While countries like South Africa, Ethiopia, Ghana, and Kenya experienced rising inequality, others like Niger and Mali have enjoyed a decline in inequality. Additionally, others like Zambia, Mozambique and Eswatini have gone through a u-shaped trend where inequality consistently fell somewhere between 1990 and 2003 and then started to rise afterward. A few others like Togo, on the other hand, have experienced an inverted u-shaped trend where inequality rises before it falls. Specifically, South Africa saw its inequality rise from 59.3% in 1993 to 63% by the 2014, Mali recorded a decrease

from 50.4% in 1994 to 33% in 2009, Zambia experienced a decrease from 60.5% in 1991 to 42.1% in 2002, then a consistent increase again to 57.1% by the end of 2015 and finally, Togo saw its inequality increase from 42.2% in 2006 to 46% in 2011 and then saw it drop to 43.1% by the end of 2015. Figure 3 below gives a visual representation of the main changes that have occurred within SSA from the early 1990s, as described above.

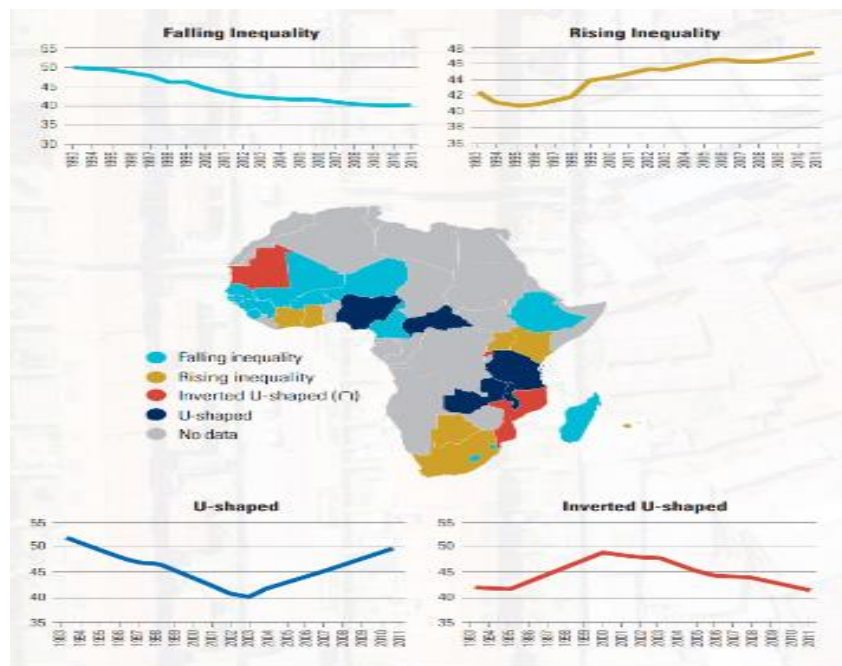


Figure 3: An overview of the main changes in inequality in SSA from the early 1990s

Source: UNDP, Income Inequality Trends in sub-Saharan Africa (2017)

Existing research such as Powell (2016), Solt (2008), and Stolzenberg, Eitle & D'Alessio (2006) have shown that income inequality is linked to a couple of social problems. Some of these include poor public health, higher crime rates, and political bias. First off, access to quality healthcare and healthy food is usually beyond the reach of poor individuals. This potentially results in malnutrition, an ineffective workforce and higher mortality rates (Powell, 2016). Also, when a bigger proportion of the society's wealth is only accessible to a few, disadvantaged members of the society are likely to feel

discriminated against (Stolzenberg, Eitle & D'Alessio, 2006). They may develop an urge to revolt, and this will in turn, increase the propensity for crime. The deprived in society may also resort to using illegal means of making ends meet because the lawful methods may be far-fetched or out of their reach (Stolzenberg, Eitle & D'Alessio, 2006). People who might have otherwise been productive now become a threat to society. Lastly, political power is concentrated in the hands of the wealthy minority who are able to manipulate governmental decisions and activities in their favour whereas the lower class is not able to influence outcomes in any way, leading to a biased society (Solt, 2008).

While these studies suggest that inequality may not augur well for society, a few others propound that inequality gives rise to growth. Notable amongst these arguments is the claim in Thorbecke and Charumilind (2002) that the “marginal propensity to save is often higher among the rich, meaning that a higher degree of initial inequality would result in higher aggregate savings, capital accumulation and growth.” Such studies tend to imply that the presence of inequality ought not to be a cause of alarm in the economic growth space since it does not impact it negatively.

Inarguably, every good government focuses on leading their nation into commendable economic growth, and even though a good number have made significant progress in that regard, many still struggle to realise the level of growth and development they desire, especially in Sub-Saharan Africa (Elu, 2000). Even in the face of strong policies, laudable projects and sustainable plans, efforts to attain economic growth sometimes prove futile. Such occurrences are usually attributed to bad governance, corruption among others (Towah, 2019). From the ways through which inequality has been identified to negatively impact economic growth, it also tends to be named as a factor

impeding growth.

In that regard, a couple of studies such as Forbes (2000), Caselli (2006), Sukiassyan (2007), and Tridico (2010) have attempted to assess the relationship between inequality and economic growth. Nonetheless, these have arrived at varying conclusions mainly due to differences in estimation methods and datasets used, making it important for studies specific to countries or regions to be conducted. Also, these studies have mostly focused on inequality and growth at the aggregate level with limited focus on inequality and sectoral growth. In that light, this study focuses on assessing the relationship between inequality and growth in the agriculture, manufacturing, and service sectors in SSA.

Research Questions

Based on the foregoing, this study seeks to answer the questions:

1. *How does the level of inequality affect the rate of agricultural growth in sub-Saharan Africa?*
2. *How does the level of inequality affect the rate of growth in the manufacturing sector in sub-Saharan Africa?*
3. *How does the level of inequality affect the growth rate in the services sector -in sub-Saharan Africa?*

Research Objectives

The aim of this study is to:

- examine the relationship between income inequality and sectoral economic growth in SSA.

Relevance of the study

A review of existing literature on inequality and economic growth reveals that most studies conduct their analysis using aggregate economic growth as measured by the growth rate of GDP. With the differences seen in the conclusions drawn by such studies, this study seeks to explore how different the findings would be if a decomposed version of aggregate economic growth, in the form of sectoral growth, is used.

This study contributes to existing literature in two main ways. First off, the study advances the knowledge base by assessing the relationship between inequality and growth in the agriculture, manufacturing and service sectors which have been less explored in literature. This is of importance because inequality may affect the different sectors differently and so looking at it at the aggregate level may not be a true reflection of the situation on the ground. This would also help to identify specific policies to enhance growth in the various sectors.

This study also provides more up-to date findings which are aligned with current changes or trends in the economic indicators being used. The study uses more recent data, with 2011 being the earliest year and 2019 being the latest. The use of recent data produces findings which are more relevant to these times as compared to most of the existing literature which use data from the late 20th century.

Overview of Research Methodology

To achieve the stipulated research objectives, this study used secondary economic data and measures such as annual growth rates in the agriculture, manufacturing and

service sectors, growth rate in gross capital formation, labour force participation rate, fertility rate and inflation rate which are available on the World Bank's Databank site. The data obtained was analysed using a quantitative approach due to its numeric nature. Data was collected across 30 SSA countries due to data availability constraints. The data was collected for 2019 or the most recent year for which each country had available inequality data. As a result, the earliest year included in the study was 2011 while the latest was 2019. This approach was used because inequality data is inconsistent and so it was unfeasible to find one year for which all selected countries have available inequality data. Following the collection of data, a regression analysis was performed to establish the relationship between inequality and growth in the agricultural, manufacturing and service sectors.

Organization of Study

This study is categorised into five chapters. The first chapter, which is the introduction, eases the reader into the core of this research by starting off with the background information associated with the research topic, a detailed problem statement, a clarification on the research questions being explored, the objectives of the study and the significance this study holds. Chapter two focuses on reviewing and critiquing existing literature on the relationship between inequality and economic growth to ensure that this study is filling an actual gap. Chapter three, on the other hand, provides a detailed description of how the research question is going to be answered. It expounds on the research method used, the data collected, and the data analysis methods employed. The fourth chapter subsequently discusses and analyses the findings of the study, and the final chapter, chapter five, provides the conclusions to the research and recommendations for further studies based on the outcome of this research.

CHAPTER TWO: LITERATURE REVIEW

Overview

This chapter lends itself to an extensive analysis of existing literature surrounding this research topic. It considers theoretical and empirical studies conducted on the concept of economic growth and its determinants, and then those that have attempted to explore the relationship between inequality and economic growth, first on a global level and subsequently on the national level. By reviewing and critiquing past literature relevant to the topic, this chapter seeks to determine the similarities and differences between past studies and identify the knowledge or methodology gaps that justify the conduction of this research.

Theoretical Framework

The concept of economic growth remains one of the fundamental areas of focus in economics. Economists have sought to understand what exactly can be termed as growth, the factors, or conditions necessary for growth to occur and above all, how to sustain growth. In these attempts to understand the intricacies of growth, several economists have come up with different theories and models. This section expounds on three of these growth theories one of which would be the underpinning theoretical framework for this study.

The Classical Growth Theory

The classical growth theory is an economic theory regarding growth which proffers that when a country experiences an increase in its population growth there would be a resulting decrease in economic growth (Gordon, 2021). The theory asserts that a temporary

increase in a nation's real GDP will directly contribute to an increase in population (or simply, a population explosion) which will result in a demand spike and make the country's resources less and less adequate for national consumption. The increase in demand, coupled with the limit in resources would then bring economic growth to a slowdown. In essence, this theory suggests that the rate of population growth and economic growth are interrelated.

The most predominant classical growth theories which were formulated by esteemed economists such as Smith, Malthus, Ricardo, and Marx and were heavily founded on the principles of long-run equilibrium, free competition and classical adjustment process have been strongly criticised (Hahn, 1982). These criticisms are founded on the arguments that, the long run equilibrium is characteristically unrealistic, the classical adjustment process does not have adequate stability features and the concept of free competition does not apply to the modern economy (Gontijo, 2000). Other criticisms of the classical growth theory are based on the arguments that the ideas of the theory are narrowly suited to a predominantly agrarian economy where methods of production do not change significantly, and that the theory underestimates the potential of technological change to transform the conditions necessary for productivity both in agriculture and industry (Harris, 2007)

The Harrod-Domar Growth Model

Another framework which attempts to explore the concept of economic growth is the Harrod-Domar Model, a Keynesian model of economic growth developed independently by Roy Harrod and Evsey Domar (Nguyen & Thong, 2019). According to this model,

economic growth is dependent on or mainly influenced by two factors which are the level of savings and capital output ratio in an economy (Pettinger, 2019). Whilst a high level of savings is needed for economic growth to occur, a low ratio of capital output is deemed ideal, because a high capital output ratio implies that investment is inefficient. The model argues that an increase in savings will lead to an increase in investments which would create a higher capital stock and translate into higher economic growth. This self-sustaining virtuous cycle of economic growth is opposed to the vicious cycle where low savings lead to low investments and then to low output.

Additionally, Harrod (1939) introduces the concept of warranted growth rate, which he explains as the growth rate at which all savings are translated into investments such that the economy does not enter a recession or expand indefinitely. The Harrod-Domar model is fundamentally based on the natural growth rate (which depends on the increase in labour force, in the absence of technological change) and Harrod's warranted growth rate. The model purports that the relationship between the warranted growth rate and the natural growth rate and how they are quickly equalized by other mechanisms, determines the state of the economy in the long run. The basic conclusion offered by this model is that even in the long run, the economy would be at best balanced on a knife-edge of equilibrium growth (Solow, 1956).

The Harrod-Domar model has, however, faced several criticisms since its inception. These criticisms are largely directed at the model's primary assumption that labour and capital exist in fixed proportions (Sato, 1964). Economists have also argued that increasing savings in a country is not as easily attainable as the model makes it seem (Pettinger, 2019). As the marginal propensity to save is low in developing countries, they

are unable to increase savings which would further generate investments and create that virtuous cycle of economic growth (Pettinger, 2019). Among many other criticisms, the model has also been criticised for exaggerating the instability of steady-growth and concluding that once the path of steady-growth is disrupted, the forces of instability erupt and induce secular inflation (Solow, 1956). Another criticism is the fact that the model ignores factors like technological innovation, labour productivity and levels of corruption and other non-economic factors which all play an important role in determining the level at which an economy grows (Baldwin & Meier, 1957). Ultimately, this model has been ruled as being too simplistic by mainstream economists and has been replaced with Solow's neoclassical growth theory (Van den Berg, 2013).

The Neoclassical Growth Theory: The Solow Growth Model

The neoclassical growth model is a growth theory hinged on a “constant returns to scale” aggregate production function which allows substitution between two inputs, capital, and labour (Prescott, 1988). In contrast to the Harrod-Domar model, the neoclassical growth model assumes that there are no rigidities, and factor proportions (between capital and labour) are flexible (Sato, 1964). The model further assumes that there is only one commodity (which is output), production shows constant returns to scale, full employment is perpetually maintained, the proportion of income saved is constant, and the stock of capital is an accumulation of the composite commodity (Solow, 1956). Solow's neoclassical growth model uses an aggregate production function which subjects capital stock to depreciation and investment to diminishing returns.

The basic conclusion of this model is that growth equilibrium is stable in the long run, in contrast to what the Harrod-Domar Model proposes (Sato, 1964). Essentially meaning that, the conflict between the natural and warranted growth rates portrayed by the Harrod-Domar model is not possible when production happens under the neoclassical conditions of constant returns to scale and variable proportions (Solow, 1956). Unless technological change and innovation continue to increase the economy's aggregate production function, the economy will eventually settle in a steady state of zero growth (Van den Berg, 2013).

Due to the limitations of the other models outlined above, the empirical analysis for this study would be underpinned by the neoclassical growth theory developed by Robert Solow.

Inequality and Economic Growth

Aside these determinants of growth, theoretical research aimed at determining the impact of unequal distribution of resources on economic growth have formed a significant aspect of economic research over the last decades, as many economists try to understand whether there is a trade-off between inequality and economic growth. Out of these numerous studies, have emerged two major contradictory theories concerning how inequality affects growth (Attanasio and Binelli, 2003). While some studies have found that inequality outrightly has a growth-reducing effect, others who employ the classical approach have proposed that inequality has the potential to enhance growth in an economy. This section considers some theoretical arguments surrounding these contrasting views.

Throughout literature, economic scholars have been able to accentuate three main avenues through which inequality impedes growth. The first, suggests that inequality can be directly linked to social evils and public ills such as higher crime rates, increase in corruption, low education levels, and poor public health (Stolzenberg, Eitle & D'Alessio, 2006). Deininger and Olinto (1999) also propounds that where income and wealth inequality is high, social discontent and violence are seen on high levels which further causes a surge in illegal activities. The society becomes prone to riots, demonstrations, strikes, public unrest and worst-case scenario, coups d'état which all affect productivity levels (Alesina & Perotti, 1996). The increase in social instability and lawlessness hinders economic growth through the direct destruction caused and the use of national resources (which could have been channelled into more productive ventures) for corrective and preventive measures (Caselli, 2006)

The second avenue identified, focuses on how the median voter theorem influences fiscal policy and taxation under political economy models, which in turn affects economic growth. According to Alesina and Rodrik (1994), in a society where average income exceeds the most prevalent income level, the demand for income redistribution is high and more voters opt for redistributive policies which include taxes on incremental earnings. When implemented, these taxes are usually high and have a distortionary effect as they lower the incentive to increase wealth, and consequently, reduce growth (Persson & Tabellini, 1994). In cases where inequality is very high, the rich may successfully prevent redistribution through unlawful means such as lobbying. However, activities like lobbying would also consume national resources, thereby, affecting economic performance

adversely. Thus, even if redistribution does not happen, inequality can negatively affect growth through the political channel (Barro, 2000).

The final avenue relates to how high inequality, in the face of financial market imperfections, affects growth. Where an economy has financial market imperfections, credit accessibility and people's ability to invest is often dependent on the income status of individuals (Caselli, 2006) and (Cingano, 2014), meaning that in an unequal society, the poor would not be able to obtain financial facilities to undertake profitable investment projects which could turn their lives around and contribute to the economy at large. (Attanasio and Binelli, 2003). Thus, in a highly unequal society, the aggregate investment level is low which further lowers the rate of economic growth.

On the other hand, literature propounding that inequality enhances growth also offer two main arguments. The first is built on the theory that the marginal propensity to save among the rich is higher than that of the poor, meaning that a higher level of initial inequality would result in higher aggregate savings, and by extension, capital accumulation and economic growth (Kaldor, 1956) and (Bourguignon, 1981). This argument has, however, been opposed by a few authors including Ray (1998), who are of the opinion that the monotonic relationship implied between income levels and the propensity to save is flawed. The second argument as seen in Mirrlees (1971) and Lazear & Rosen (1981), stems from the idea that inequality has the tendency to generate the incentive to work harder and invest more. For instance, when the poor see that the people with higher level of education gain higher rates of return, they would be encouraged to attain higher education and would thus become more productive, which will subsequently boost economic growth.

Empirical Evidence

The Global Context

Considering general empirical evidence, three main different views or conclusions pertaining to how inequality affects economic growth are evident; the first two seen with the theoretical arguments mentioned above and a third, which proffers that it is simply misleading to declare a strict positive or negative relationship between the two variables.

The first and more common proposition offers that inequality is negatively related to economic growth. In other words, in the presence of high inequality, the rate of economic growth is lower than in its absence. Caselli (2006) performing a cross-country regression analysis on a sample of thirty-nine developing countries, using an estimating equation based on the idea of conditional convergence of the modern growth theory and, found that initial income and land inequality has a growth-reducing impact in the long run. Although this study comes to a firm conclusion on the negative relationship between inequality and growth, it does not provide details on the relationship due to its inability to identify the channels through which inequality affects growth.

Sukiassyan (2007) who also evaluates the growth-inequality relation by focusing on transitional economies from Central and Eastern Europe and the former Soviet Republics finds that inequality has a strong negative influence on growth. After using a sample of seventy-four countries and an ordinary least squares cross-country model for their statistical analysis, Vu and Mukhopadhaya (2011) also arrive at the same conclusion. By breaking down their sample into high-, middle-, and low-income countries, Vu and Mukhopadhaya (2011) sought to determine whether the relationship varies among

countries with different income levels. Although they conclude on a general negative connection between inequality and growth, they discovered that the relationship is stronger in low-income countries, such that, a reduction in inequality would be of more essence to low-income countries (who would grow faster than middle- and high-income countries if they are all to experience a reduction in inequality).

The next proposition offered by empirical evidence is the idea that inequality enhances growth in an economy. In estimating how the changes in income inequality correlate with changes in growth for a given country, Forbes (2000) observed that there is a considerable positive relationship between inequality and economic growth in the short and medium terms by using a sample of forty-five countries and a panel data structure. Findings from Forbes (2000) plainly imply that reducing inequality would mean foregoing possible economic growth. Additionally, Tridico (2010), using a sample of fifty emerging and transitional economies saw that despite a worsening trend in inequality from 1995 to 2006, countries were able to experience significant economic growth. Therefore, suggesting that inequality does not necessarily harm growth. Li and Zou (1998) also using a sample of forty-six countries and a panel data structure found the same positive relationship between the two variables.

The final proposition maintains that it is illusive to generalise and declare a strict positive or negative relationship between inequality and economic growth. Most findings supporting this assertion propose that the relationship varies across different groups segregated on an income basis (example, rich countries and poor countries) or across different inequality levels. This is highlighted by Barro (2000) who using a sample of sixty-three countries found an insignificant relationship for the overall sample but found a

negative relationship for poor countries and a positive relationship for rich countries. This finding is further supported by Castello-Climent (2010) using a sample of OECD countries, Galbraith and Kum (2003) on a sample of one hundred and fifty countries and De Dominicis, Florax & De Groot (2008) who conducted a quantitative analysis of existing empirical evidence. Other studies like Balcilar, Gupta, Ma & Makena (2021) take it from an inequality level perspective where they conclude that up to an average Gini Coefficient threshold of 35.92, inequality positively influences growth, then thereafter, a negative relationship is observed.

The differences observed in these research findings are largely attributed to differences in estimation methods, data quality and sample coverage. Many cross-sectional studies found in empirical literature find that there is a negative relationship between growth and inequality. The kind of regression performed in these cross-sectional studies is mainly criticised on the account that cross-country estimates omit certain variables and may therefore be biased. This criticism maintains that factors like institutions, climate and technology and other country-specific variables which may be key determinants of economic growth rates should not be overlooked but correlated with the explanatory variables considered in the model (De Dominicis, Florax & De Groot, 2008). Additionally, it is observed that the negative effect, however, seems to disappear when panel data techniques are used for the model estimations. These opposing views and findings suggest that it may be more useful to conduct research on determining the relationship between inequality and economic growth using single-country data at a regional level or a set of homogenous countries adequately controlled for country-wide differences (De Dominicis, Florax & De Groot, 2008). However, due to how slow changes in inequality are, it is

infeasible to perform a time series analysis (Casselli, 2005). Thus, a cross-section analysis would be performed using countries in sub-Saharan Africa which are relatively homogenous.

Scaling down to literature on income inequality and sectoral growth, Gonzalez and Resosudarmo (2018) using panel data from Indonesian cities and districts set out to provide evidence of a “causal relationship between economic growth in the manufacturing, agriculture and services sectors and income inequality” in Indonesia. After running between-effects and instrumental variable regressions, it was discovered that the manufacturing and services shares of economic growth have a positive causal association with inequality while the agriculture sector has a negative causal association with inequality.

Similarly, Raeskyesa (2020) utilizing panel data for ASEAN countries of low-middle income status explored the relationship between income inequality and growth in the economic sectors such as manufacturing, service and agriculture. This study found a significant negative relationship between the agriculture share of GDP and income inequality.

Notably, the few studies found to have focused on assessing the relationship between inequality and sectoral growth were all tailored to countries or regions outside Africa, making it necessary for studies centred on Africa to be conducted to fill that gap.

The Sub-Saharan Africa Context

Narrowing down to Sub-Saharan Africa, literature regarding inequality and economic growth have also arrived at varying conclusions.

Starting off, Nel (2003) focuses on determining the effect of income distribution on economic growth for a sample of sub-Saharan African countries using “household-expenditure-based” data of high quality. This study employed an ordinary least squares (OLS) technique based on a standard reduced-form growth regression model to estimate how income inequality affects growth. The researcher finds that over the medium term, higher levels of inequality have a negative bearing on the prospects for economic growth. However, the study asserts that the effect found is weak and thus, the negative relationship determined is not robust. Similarly, a study by Onwuka (2021), also found a weak negative relationship between in inequality and economic growth but specifically for Nigeria.

Habimana (2014) using a Random Effects estimation model on a panel of 29 sub-Saharan Africa countries for the period between 1980 to 2011, investigated the relationship between the Gini coefficient and the growth rate of a country's Gross Domestic Product (GDP). For this study, GDP growth rate is regressed on the measure of inequality, which is the Gini index while other independent variables such as education and fertility rate are added as control variables to cater for other channels by which inequality can affect growth. This study ultimately found that there is no significant relationship between economic growth and inequality in sub-Saharan Africa. Nwosa (2019) using an autoregressive distributed lag estimation technique to analyse data covering the period 1981 to 2017 also examined the relationship between income inequality and economic growth specifically for Nigeria and the implication for the country's economic development. This study

similarly discovered a positive but insignificant relationship between inequality and economic growth.

Hakura, Hussain, Newiak, Thakoor and Yang (2016) in an IMF working paper publication also find that income inequality is strongly negatively related to GDP per capita growth. This study employs a different approach of jointly using dynamic panel regressions and new time series data to identify how both income and gender inequality affect economic growth. It focuses on examining the relationship at different stages of development and finds that the growth reducing effect of inequality on economic growth is mainly prevalent for lower-income countries. The study specifically determines that if inequality was reduced significantly to the level observed in the fastest-growing Asian countries, the growth rate for per capita income could increase by “0.9 percentage points” on average. Hakura et al (2016) goes on to suggest that if policies centred on giving low-income household and women the opportunity to adequately participate in economic activities were well-designed and efficiently implemented, they would largely help alleviate inequality.

The studies above, embody the three different conclusions arrived at for the relationship between inequality and economic growth for sub-Saharan Africa. The first being that there is a weak negative relationship, second being that there is no significant relationship and lastly, that there is a strong negative relationship. These differences in findings are mainly attributed to differences in estimation methods and variation in data. Notably, all these studies also solely focus on aggregate economic growth with GDP as the measure. As such, this study would go on to explore whether there would be different findings if sectoral economic growth is considered.

CHAPTER THREE: METHODOLOGY

Overview

This chapter focuses on the research methodology employed to achieve the objectives of this study. It discusses the data collection and analysis techniques and tools utilised to fulfil the research requirements, as well as the reliability and validity of the study.

Justification of Empirical (or Econometric) Model and Relevant Variables

This study aimed to achieve the stipulated research objectives by performing a quantitative analysis on secondary data to be obtained from the World Bank's World Development Indicators. To determine the relationship between inequality and economic growth, the researcher performed an ordinary least squares (OLS) multiple regression on cross-sectional data. The OLS method was applied because it is well suited to examining the relationship between continuous explanatory variables (X) and a continuous response variable (Y), and a multiple regression because more than one explanatory variable is being considered. In this case, the response variable would be sectoral economic growth (manufacturing, agriculture, and service sectors) while the explanatory variables would be inequality, denoted by the Gini index, labour force participation rate, growth rate in gross capital formation, fertility rate and inflation rate.

Data Description

This study uses pooled cross-sectional data from 30 sub-Saharan African countries. The data for each country was collected for 2019 or the most recent year for which the country had inequality data available. —To measure sectoral economic growth, which was the dependent variable, the study used the annual growth rates in the manufacturing, agriculture, and services sectors. The annual growth rates refer to the changes in the annual values of the value added from these sectors, expressed as percentages. These data were retrieved from the World Bank's World Development Indicators.

Independent Variables

Inequality – Gini Coefficient

For inequality, this study uses the Gini coefficient as the measure of inequality. The Gini coefficient measures inequality by percentages or decimals with a 0% or 0.0 being the least and representing a state of perfect equality and 100% or 1.0 being the highest and alluding to a state of perfect inequality (OECD, 2021). This index estimates inequality by comparing aggregate proportion of the country's population with the income they receive (OECD, 2021). Although the Gini index has several advantages, significant amongst them is the fact that it is simple to interpret. The Gini Index data would be retrieved from the World Bank.

Labour Force Participation Rate (% annual growth)

According to the International Labour Organization, the labour force participation rate is a measure that signifies the size of labour supply available and willing to indulge in the production of goods and services. It measures the proportion of the working age population in a country who by virtue of working or looking for work, actively engage in the labour market. In accordance with the proposition from the Solow growth model that growth of labour is a factor that affects the long run growth of GDP, this variable is going to be included in the econometric model to control for other channels affecting growth aside inequality.

Gross Capital Formation (% annual growth)

According to the OECD's Glossary of Statistical Terms (2001), gross capital formation refers to "the total value of the gross fixed capital formation, changes in inventories, and acquisitions less disposals of valuables for a unit or sector." Plosser (1992) suggests that gross capital formation is an important measure because it affects economic growth directly by increasing the stock of physical capital in a domestic economy. The Solow model also explains that capital is one major factor that affects economic growth in the long run. Hence, this study includes the growth rate for gross capital formation as a control variable to ensure a more accurate estimation of the relationship between inequality and growth.

Fertility Rate

Fertility rate is the measure of the number of babies born alive to women, proportionate to the population of women of childbearing age. It is the ratio of the number of live births recorded in a year to the female population within the childbearing age bracket. According

to Suwoto and Zhai (2016), research has shown that lower fertility rates boost economic growth. Due to this observation, fertility rate was included as a control variable.

Inflation Rate

The final independent variable included in the model was inflation rate which measures the rate of price increases over a period. Inflation reportedly has a negative association with economic growth as it reduces the level of investment and how efficiently factors of production are used (Andrés & Hernando, 1997). Due to this association, inflation was also included in the model as a control variable. The GDP deflator measure was chosen for this study since it is more comprehensive than the CPI (Stanford, 2008).

Discussion of Estimation Procedures and Relevant Tests

Conducting an ordinary least squares regression on cross-sectional data has the tendency to yield spurious results if certain key characteristics of the data are either present or absent. Properties such as homoscedasticity and multicollinearity need to be checked for, to ensure that the analysis would produce valid and consistent results (Pervaiz, Chani, Jan, and Chaudhary, 2011). A cross-sectional OLS analysis should ideally be performed only if the data has a normal distribution, the explanatory variables are not perfectly intercorrelated (that is, there is not multicollinearity), the variables are exogenous

To check for these properties, diagnostic tests for homoscedasticity and multicollinearity were performed prior to the actual data analysis. The Breusch-Pagan test

for heteroscedasticity was used to confirm homoscedasticity while a correlation matrix was used to assess multicollinearity.

For the actual data analysis, the following estimating equation was used with inference from the Solow Growth model:

$$G_{M, A, S} = \beta_0 + \beta_1 \text{GINI} + \beta_2 \text{GCF} + \beta_3 \text{FERTILITY} + \beta_4 \text{LABOUR} + \beta_5 \text{INFLATION} + \varepsilon$$

Where:

G_M = the growth rate in the manufacturing sector

G_A = the growth rate in the agriculture sector

G_S = the growth rate in the service sector

Gini = the measure of inequality based on the Gini index

GCF = the annual growth rate computed for gross capital formation

Fertility = the total fertility rate (births per woman)

Labour = the annual growth rate calculated for labour force

Inflation = the annual rate of inflation recorded

ε = the error term

Reliability and Validity of the Research

In carrying out such a study, it is important to ensure that the results obtained, and the processes used are reliable and valid. Reliability of the research refers to how consistent the result from this research is or would be with other studies conducted on the same variables. To ensure reliability, data used was obtained from credible and approved sources like the World Bank, and The World Inequality Database.

On the other hand, validity entails conducting the research in a manner such that the results obtained are unadulterated or not influenced to move in a certain direction. By not manipulating the estimating methods or falsifying data obtained and by applying methods that are rightly suited to the data, this research aims to produce results which are valid and justifiable.

CHAPTER FOUR: RESULTS

Overview of Chapter

This chapter is dedicated to a detailed presentation and thorough discussion of the results obtained from the data analysis carried out. The chapter expounds on the findings of this study as relates to the objectives and attempts to grant the reader an idea of where this study falls amidst existing empirical literature.

Descriptive Statistics

Table 5: Summary statistics of all variables

	<i>Gini index</i>	<i>GCF</i>	<i>Fertility rate</i>	<i>Labor force</i>	<i>Inflation</i>	<i>Agriculture</i>	<i>Manufacturing</i>	<i>Services</i>
Mean	42.70	4.55	4.55	68.31	7.00	2.05	3.32	4.44
Standard Error	1.40	2.64	0.30	1.81	1.85	1.82	1.12	0.64
Median	42.25	6.69	4.60	69.56	3.82	4.17	3.83	5.08
Standard Deviation	7.68	14.46	1.62	9.90	10.14	9.98	6.15	3.52
Sample Variance	58.97	209.20	2.63	98.08	102.91	99.67	37.85	12.39
Kurtosis	0.68	0.71	8.13	-0.66	11.51	8.58	3.08	-0.22
Skewness	0.91	-0.61	1.90	-0.09	3.16	-2.72	-0.76	-0.22
Range	33.40	66.01	9.54	37.52	50.93	49.80	33.74	13.35
Minimum	29.60	-32.92	1.44	47.13	-0.84	-37.62	-15.52	-2.24
Maximum	63.00	33.10	10.98	84.65	50.09	12.18	18.22	11.11
Sum	1280.90	136.62	136.51	2049.34	210.12	61.42	99.48	133.17
Count	30	30	30	30	30	30	30	30

Source: Author's estimations using data from the WDI

Table 4.1 above contains the descriptive statistics of all the variables, both independent and dependent, used in this study. For the dependent variables, while the growth rate of the manufacturing sector ranged from -15.52% to 18.22%, that of agriculture ranged from -37.62% to 12.18% and that of service, from -2.24% to 11.11%. Comparing the three sectors, it is seen that the manufacturing sector recorded the highest growth rate

(18.22%) across the sectors, while the agriculture sector recorded the worst decline (-37.62%). However, the service sector recorded the highest average growth rate of 4.44% across the region, with the lowest standard deviation of 3.52. This is followed by the manufacturing sector with an average growth rate of 3.32 % and a standard deviation of 6.15. The agriculture sector then follows with a 2.05% mean growth rate and a standard deviation of 9.98. The trends in these sectoral growth rates may be an indication that the efforts aimed at transforming the economies within the SSA region from agrarian to industrialised ones are yielding significant results.

Moving on to the independent variables, it is observed that the mean Gini index had a minimum of 29.60% and a maximum of 63% across the region. The average was then determined to be 42.70%, with a standard deviation of 7.6. These values observed for the Gini index confirm that inequality within the region is relatively on the high side and largely heterogenous.

For gross capital formation, an average growth rate of 4.55% and a standard deviation of 14.46 was obtained. The lowest rate observed was -32.92% which represents a decline in capital formation, while the highest rate was 33.10%. These values indicate that the region collectively has a long way to go in terms of boosting capital formation, which can in turn notably accelerate economic growth (Meyer & Sanusi, 2019).

Fertility rate also returned an average of 4.55, with a standard deviation of 1.62. While the highest fertility rate for the data sample was 10.98, the lowest was 1.44. With the global average fertility rate being 2.5 and the UNDP's fertility threshold being 2.1, SSA can be said to have a high fertility rate, which transforms into rapid population growth.

Moving on to labour force participation rate (LFPR), a mean rate of 68.31% and a

standard deviation of 9.9 was obtained. The lowest rate recorded was 47.13% whereas the highest turned out to be 84.65%. Comparing these statistics to the global highest LFPR of 87.41% and the global average of 59.6% in 2020 (according to data from the World Bank), it can be concluded that SSA has very good labour force participation.

Finally, the inflation rate averaged 7% with a standard deviation of 10.14. The highest inflation rate observed was 50%. -0.84%, on the other hand, was the lowest rate recorded for the data sample.

Relevant Tests for Multiple Regression Analysis

In running a multiple linear regression analysis, it was important to inspect the data by running relevant tests to ensure that the data collected satisfy the following assumptions on which the multiple linear regression method is based. The pre-estimation tests carried out in this study including tests for multicollinearity and homoscedasticity.

Test for Multicollinearity

Multicollinearity refers to the occurrence of having explanatory variables in model which are strongly correlated. The statistical inferences of a model which has multicollinearity among its independent variables are considered less reliable. To test for multicollinearity in this model, a correlation matrix generated by the data analysis software was used. From the correlation matrix below (Table 4.2), it is seen that no pair of the independent variables are perfectly related. All the correlation coefficients for the independent variable pairs do not exceed 0.7, which is the accepted threshold for the multicollinearity problem (Rekha,

2019). Thus, this model does not suffer the problem of collinearity among the independent variables.

Table.6: Correlation Matrix

	<i>Gini index</i>	<i>GCF</i>	<i>Fertility rate</i>	<i>Labor force</i>	<i>Inflation</i>
Gini index	1				
GCF	-0.16	1			
Fertility rate	-0.06	0.17	1		
Labor force	0.16	0.16	0.08	1	
Inflation	0.13	-0.05	0.68	0.12	1

Test for Heteroscedasticity

To accurately run a multiple linear regression, it is important to ensure that the distribution of the residuals has equal variance along the different points of the model. This is to say that the amount of error in the residuals should be similar at each of the predictor variable levels. This assumption is known as homoscedasticity and its violation thereof, as heteroscedasticity. To test for the presence of homoscedasticity or the absence of heteroscedasticity, the Breusch-Pagan test was employed. The Breusch-Pagan test is a formal statistical test used to determine whether heteroscedasticity exists in the model being used.

The test is based on the following hypotheses:

H_0 = Homoscedasticity is present

H_1 = Heteroscedasticity is present

Using a significance level of 0.05, the null hypothesis is rejected if the p-value derived from the test is less than 0.05. Otherwise, we fail to reject the null hypothesis.

For this analysis, a p-values of 0.10, 0.28, and 0.23 were obtained as seen in Table 4.3 below. Since the p-values for all three regression models are greater than 0.05, the null hypothesis is not rejected. Thus, it can be concluded that the data is homoscedastic or has no trace of heteroscedasticity. In other words, the residuals of the variables used are distributed with equal variance.

Table 7: Summary result from Breusch-Pagan Test for Heteroscedasticity

	<i>Agriculture</i>	<i>Manufacturing</i>	<i>Services</i>
Chi-square	9.18	6.31	6.90
P-Value	0.10	0.28	0.23

Source: Author's estimations using data from WDI

After ensuring that the conditions of no multicollinearity and no heteroscedasticity were satisfied, the regression models were then run to estimate the relationship between inequality and growth in the three sectors.

Discussion of Results

Regression Model 1: With Growth in the Agriculture Sector as the Dependent Variable.

To answer the first research question, which was aimed at determining the relationship between inequality and growth in the agriculture sector, a regression analysis was run using growth in the agriculture sector as the dependent variable. From the output obtained, it is seen that coefficient estimates of -0.28, 0.10, -1.00, -0.02, and -0.53 were derived for inequality, capital formation, fertility rate, labor force, and inflation respectively.

Capital formation, fertility rate and labour force had p-values greater than 0.05 and t-statistics less than 2, implying that although these variables have been noted to be linked with overall economic growth, they do not have a significant relationship with growth in the agriculture sector in SSA. On the contrary, inflation rate had a p-value of 0.01 and a t-statistic of -2.75 which implies that inflation has a significant relationship with growth in the agricultural sector. Since the coefficient estimate derived is -0.53, the relationship thereof is negative. Andrés and Hernando (1997) discovered a similar negative significant relationship between inflation and economic growth upon assessing some OECD countries.

Considering the magnitude of the coefficient (-0.53), it can be concluded that there is a moderate negative relationship between inequality and inflation rate. It also implies that a unit increase in the inflation rate will lead to a decline in output from the agriculture sector by 0.53 percentage points. The concept that inflation reduces the level of investment within an economy and how efficiently factors of production are used (Andrés &

Hernando, 1997) can be an explanation for the significant negative relationship found between growth and inflation.

Moving on to inequality, the Gini index had a p-value of 0.14 which is more than 0.05 and a t-statistic of -1.52 which is less than 2, the acceptable threshold. While the coefficient of -0.28 implies that there is a negative relationship, the p-value and t-statistic imply that the relationship between inequality and agricultural growth in the SSA region is non-significant.

The non-significant relationship found between inequality and growth in the agriculture sector is in line with the finding by Habimana (2014) that a non-significant relationship exists between inequality and economic growth in SSA. It is, however, in slight contradiction with Raeskyesa (2020) who found a significant negative relationship between inequality and growth in the agriculture sector for selected ASEAN countries. The non-significant relationship primarily implies that changes in inequality are not consequential to the agriculture sector in SSA. This may suggest that inequality does not necessarily have to be a factor of concern when it comes to deciding how to boost growth in the agriculture sector.

The table below provides a summary of the estimation output for this model.

Table 8: Summary Output for Agriculture Model

<i>Regression Statistics</i>	
Multiple R	0.74
R Square	0.55
Adjusted R Square	0.46
Standard Error	7.33
Observations	30

<i>ANOVA</i>					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	5	1600.82	320.16	5.96	0.001
Residual	24	1289.63	53.73		
Total	29	2890.45			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 90.0%</i>	<i>Upper 90.0%</i>
Intercept	23.44	12.79	1.83	0.08	-2.96	49.83	1.56	45.31
Gini index	-0.28	0.19	-1.52	0.14	-0.67	0.10	-0.60	0.03
GCF	0.10	0.10	1.04	0.31	-0.10	0.31	-0.07	0.28
Fertility rate	-1.00	1.22	-0.82	0.42	-3.51	1.51	-3.09	1.08
Labor force	-0.02	0.14	-0.14	0.89	-0.31	0.27	-0.26	0.22
Inflation	-0.53	0.19	-2.75	0.01	-0.94	-0.13	-0.87	-0.20

Source: Author's estimations using data from WDI

Regression Model 2: With Growth in the Manufacturing Sector as the Dependent Variable

Moving on, the next regression model employed growth in the manufacturing sector as the dependent variable. This was with the aim of answering the second research question of how inequality affects the rate of growth in the manufacturing sector. After the necessary data analysis methods were applied, the output in Table 4.5 below was obtained.

For this output, coefficient estimates of -0.31, 0.05, 0.85, 0.10, and -0.02 were obtained for inequality, capital formation, fertility rate, labor force and inflation respectively. The coefficients estimates derived for capital formation, fertility rate and labour force indicate that there is a positive relationship between each of those variables and growth in the manufacturing sector. While that for inflation rate suggests that there is a negative relationship. However, since these variables had p-values greater than 0.05 and t-statistics less than 2, these relationships are insignificant. Again, this implies that although these factors are known to be generally linked with economic growth, they do not have a substantial interaction with growth in the manufacturing sector.

For inequality (the main independent variable), a p-value of 0.05 and a t-statistic of -2.10 were obtained. In accordance with their respective rules of thumb, these figures indicate that the relationship between inequality and economic growth is significant. Since the coefficient estimate derived for the Gini index is negative (-0.31), this relationship is negative. The negative relationship found between inequality and growth in the manufacturing sector is however weak due to the magnitude of the coefficient. Also, a coefficient of -0.31 essentially means that a unit increase in inequality will lead to a reduction in economic growth by 0.31 percentage points if every other predictor variable is held constant. The negative relationship found in this model is corroborated by Nel (2003) and Onwuka (2021) who found the same weak negative relationship between inequality and economic growth in SSA and Nigeria respectively.

The significant negative relationship identified for the manufacturing sector is validated by some insights uncovered earlier in this study. Through the literature review, it was discovered that theoretical reviews of this topic suggest that inequality has a growth-

reducing impact through three main avenues. These avenues include how the median voter theorem affects taxation and fiscal policy which then affects economic growth (Persson & Tabellini, 1994), how inequality is directly linked to social evils which cause actual destruction to resources which could have been used productively (Deininger & Olinto, 1999) and finally, how credit market imperfections are worsened when inequality is high which then slows down growth (Attanasio & Binelli, 2003). From these theories, it is expected that inequality would have a negative relationship with economic growth. and this has proven to be so for economic growth in the manufacturing sector, in this case.

In that vein, it may be right to conclude that the SSA region is, to an extent, plagued by poor taxation and fiscal policies, a significant level of social crimes and high financial market imperfections (making it difficult for the people to save and invest which was actually confirmed by the low level of capital formation observed in the data), thereby making it possible for inequality to undermine economic growth especially in the manufacturing sector.

The table below provides a summary of the estimation output from this regression model.

Table 5: Summary Output for Manufacturing Model

<i>Regression Statistics</i>	
Multiple R	0.51
R Square	0.26
Adjusted R Square	0.11
Standard Error	5.80
Observations	30

<i>ANOVA</i>					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	5	288.98	57.80	1.72	0.17
Residual	24	808.65	33.69		
Total	29	1097.63			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>
Intercept	5.82	10.13	0.57	0.57	-15.08	26.71	-15.08
Gini index	-0.31	0.15	-2.10	0.05	-0.62	-0.01	-0.62
GCF	0.05	0.08	0.67	0.51	-0.11	0.22	-0.11
Fertility rate	0.85	0.96	0.88	0.39	-1.14	2.84	-1.14
Labor force	0.10	0.11	0.87	0.39	-0.13	0.33	-0.13
Inflation	-0.02	0.15	-0.10	0.92	-0.33	0.30	-0.33

Source: Author's estimations using data from WDI

Regression Model 3: With Growth in the Services Sector as the Dependent Variable

For the final regression model, growth in the services sector was used as the dependent variable in the bid to determine how inequality relates to growth in that sector. The output obtained in Table 4.6 below contains the results of this regression model.

From the output, it is seen that, capital formation had an estimate of -0.1, fertility rate had 1.39, labour force had an estimate of 0.05 while inflation had -0.11. These coefficient estimates imply that there is a negative relationship between capital formation and growth, and inflation and growth for the service sector whereas there is a positive relationship between fertility rate and growth and labour force participation rate and

growth.

Judging from their p-values and t-statistics, however, it can be inferred that the relationship between the independent variables; capital formation, labour force participation and inflation, and the dependent variable are all non-significant. On the contrary, the relationship between fertility rate and growth in the service sector is positive and significant. The positive significant relationship found between fertility rate and growth in the services sectors is contrary to existing studies such as Ranganathan, Swain and Sumpter (2015), Lee (2012) and Ashraf, Weil and Wilde (2016) which all found that a decrease in fertility rate results in an increase in economic growth or income per capita. Dominiak, Lechman and Okonowicz (2014), however, found a u-shaped relationship between fertility and economic growth, and it can be said that for the data collected, SSA falls in the phase of a positive association. According to Dominiak et al. (2014) this positive relationship stems from the fact that changes in state policies, income inequalities and social attitudes implemented to increase fertility may consequentially alter certain social norms which may in turn lead to growth within the economy.

For inequality, a correlation coefficient of 0.03 was derived. This would have implied that a unit increase in inequality lead to an increase in output within the service sector by 0.03 percentage points. However, with a p-value of 0.74 and a t-statistic of 0.34, this relationship is distinctly non-significant, and implies that changes in inequality are inconsequential to the service sector. This finding is right in line with Nwosa (2019) who also found a positive but non-significant relationship between inequality and economic growth in Nigeria.

Table 6: Summary Output for Services Model

<i>Regression Statistics</i>	
Multiple R	0.50
R Square	0.25
Adjusted R Square	0.09
Standard Error	3.35
Observations	30

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	5	90.04	18.01	1.61	0.20
Residual	24	269.15	11.21		
Total	29	359.19			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	-5.80	5.84	-0.99	0.33	-17.86	6.26	-17.86	6.26
Gini index	0.03	0.09	0.34	0.74	-0.15	0.21	-0.15	0.21
GCF	-0.01	0.05	-0.22	0.83	-0.10	0.08	-0.10	0.08
Fertility rate	1.39	0.56	2.51	0.02	0.25	2.54	0.25	2.54
Labour force	0.05	0.07	0.77	0.45	-0.08	0.18	-0.08	0.18
Inflation	-0.11	0.09	-1.19	0.24	-0.29	0.08	-0.29	0.08

Source: Authors' estimations using data from WDI

In summary, the data analysis carried out in this study reveals that, inequality has a significant negative relationship with growth in the manufacturing sector. Implying that the growth prospect of the manufacturing sector is reduced when inequality is increases. Conversely, a non-significant positive relationship was found for the services sector and a non-significant negative relationship for the agriculture sector. Fertility rate was, however, found to have a significant positive relationship with growth in the services sector and a negative significant relationship was found between inflation rate and growth in the agriculture sector.

CHAPTER FIVE: CONCLUSION

Overview

This final chapter provides a recap of the results derived in the previous chapter and draws conclusions based on the findings. It also offers recommendations future studies and for policymakers to help address issues of inequality. It then ends with the limitations present in this study.

Summary of Findings

Considering the rising level of inequality within the sub-Saharan Africa (SSA) region and its potential impact on the quality of life of the people, this study set out to determine the relationship between inequality and sectoral economic growth. Using a pooled cross-sectional data from 30 SSA countries, an ordinary least squares multiple regression analysis was performed to fulfil the objective of this study. From the data analysis, it was determined that, annual percentage growth in the agriculture and manufacturing sectors is negatively related to inequality. While growth in the services sector is positively related with inequality. This means that, as inequality within the region rises, growth prospects for the agriculture and manufacturing sector are lower whereas growth is not compromised in the services sector even if inequality rises.

Howbeit, it was also determined that the relationship between inequality and growth in the agriculture and service sectors is statistically non-significant. Implying that, inequality is not a major factor that affects growth within those sectors. On the other hand, the relationship determined for the manufacturing sector was significant and suggests that in the presence of high inequality, growth within the manufacturing sector is undermined.

From the significant negative relationship derived for the manufacturing sector, it can be deduced that the avenues through which inequality negatively impacts economic growth are existent in the SSA region. Pointedly, it can be concluded that over the years, the high level of income inequality has promoted “unproductive rent-seeking” activities which reduce the growth prospects associated with property rights. Again, the findings indicate that the high level of inequality in the region has caused a reduction in the incentive to accumulate wealth due to an increased demand for income redistribution, thereby reducing economic growth as suggested by the median voter theorem. Finally, it can be inferred that the credit market imperfections in SSA are high and as such poorer citizens are unable to access credit or loans to undertake ventures specific to the manufacturing sector that would have improved their personal economic conditions and the nation’s at large.

Recommendations

Based on the significant negative relationship identified between inequality and growth in the manufacturing sector, this study recommends that policy makers should implement measures that will ensure a decline in inequality. Specifically, redistributive policies such as making the tax code more progressive to ensure that the poor are comparatively taxed less and instituting social benefit programs targeting lower-income families would be a good way to attempt bridging the income gap within SSA countries. Aside that, educational policies that make it easier for the poor to easily access high quality education should be implemented to increase the economic mobility of the underprivileged

and reduce inequality. These policies should be directed especially at the manufacturing sector to make it easier for people below a certain income bracket to venture into the sector.

For future studies, attention can be shifted to other forms of inequality like gender, health, and education to gain a holistic view on the impact of inequality. Additionally, future research on SSA can focus on only the ten most unequal countries which contribute to the high level of inequality in the region to highlight the impact of inequality on growth specific to those countries. A qualitative analysis can also be undertaken to assess people's views on how inequality in society affects their economic and social wellbeing.

Limitations

The major limiting factor faced during this study was the data availability constraint. During the data collection stage, it was realised that a good number of sub-Saharan African countries did not have consistent data for some variables or much worse had no data at all for the time considered. Such countries had to be omitted from the sample. As a result, out of 48 countries in the sub-Saharan Africa region, only 30 countries could be used for the study. However, since the sample size is more than half of the region's population, it is a plausible representation of the target population.

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